Fall | 2011

A-F Letter Grade Accountability System Technical Manual

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Arizona's A-F Letter Grade Accountability System
2011 Technical Manual
Published November 2011

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Contents

Overview of the A-F Letter Grade Accountability System

This section provides a general summary of the new accountability system and the components used to calculate the A-F letter grades. The detailed descriptions and methodologies used to calculate each component included in the model and the final letter grades are provided in subsequent sections of this manual.

The new A-F Letter Grade Accountability Systems is distinct for two reasons. First, it emphasizes longitudinal student-level growth as a primary indicator of school achievement. The purpose of the growth component is to provide a better understanding of how well a school or district is growing its student population by describing academic gain relative to academic peers over time. Growth is determined by comparing the change in AIMS test scores from one year to the next for similarly achieving students statewide. Including a longitudinal student growth component into an accountability system is particularly important because it also accounts for the academic gains of the lowest achieving students and recognizes the degree to which these students gain academic ground from one year to the next.

Second, school districts and charter holders are also being held accountable under the new system and will receive annual letter grades in the same manner as individual schools with all calculations aggregating to the LEA level. The intent of district letter grades is to acknowledge the responsibility that LEAs have in ensuring the academic success of the students within the schools they oversee.

The A-F Letter Grade Accountability System

- Components of the Model

Arizona Revised Statute (*A.R.S. §15-241*) requires that the Department shall determine the criteria for each school and school district classification using a research based methodology, which is defined as the systematic and objective application of statistical and quantitative research principles to determine a standard measurement of acceptable academic progress for each school and school district.

The following are to be included in the evaluation of schools and LEAs under the new A-F system:

- The percentage of students who met or exceeded on the AIMS assessment
- A student mobility adjustment
- The distribution of achievement at each school *and* LEA
- Longitudinal indicators of student gain
- ELL test results
- The annual dropout rate (High Schools only)
- The annual graduation rate (High Schools only)

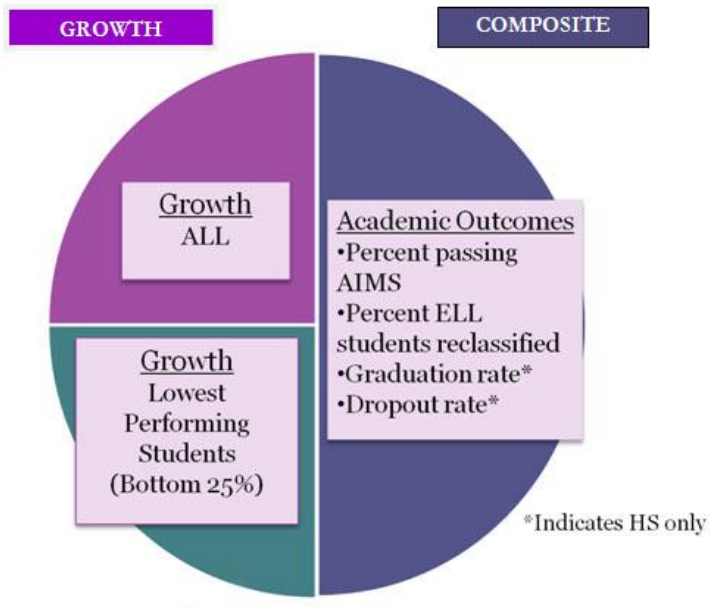
Aside from the components listed above state statute also mandates that 50 percent of the school and school district classification determination (i.e., A-F Letter Grade) shall consist of academic performance measurements. The academic performance measurement shall consist of:

1) a measurement of academic gain for all pupils enrolled at the school or school district (totaling 50 percent of the academic performance measurement) and
2) a measurement of the 25 percent of pupils with the lowest academic performance measurement enrolled at the school or school district (totaling 50 percent of the academic performance measurement).

Arizona Revised Statute (*A.R.S. §15-241*) also requires that the Department develop parallel models to evaluate the following types of schools in order to account for their unique school characteristics:

- Alternative schools
- Accommodation schools
- Extremely Small Schools
- K-2 schools

Alternative schools, extremely small schools and K-2 schools did not receive a letter grade in 2011. The Department anticipates that models for these school types and technical changes will be developed in collaboration with school leaders, educators and technical experts. The recommended models and technical changes will be presented to the State Board of Education for consideration and final adoption by spring 2012. The figure below illustrates the required components included in the accountability model:



- Student Selection Criteria

The following provides details and descriptions of the selection criteria used to identify the students who were included in the calculation of a school or district letter grade.

- Full Academic Year (FAY) students – Students were included in the composite and growth portions of the A-F model if they were enrolled within the first ten days of the school's calendar year and continuously enrolled up until the date of testing.

- Students with a valid test score – students who had a performance level greater than 0 were included in the composite and growth portions of the model. (performance > 0)

- English Language Learner (ELL) students – Any student identified and categorized as ELL, were non-mobile (i.e. FAY) and had a valid test score are included in the Composite and growth portions of the model.

- Special Education (SPED) Students - SPED students who did not take AIMS-A, tested without modifications and students whose IEP allowed for testing were also included.

- For the growth component, students that had, at minimum, a test score for the two most recent school years (i.e., FY10 and FY11). Students with test scores for 2011 only were included in the composite portion of the model, but were *not* included in the student growth calculations.

Data used to Calculate Letter Grades

- AIMS Mathematics and Reading scale scores were used to measure growth for students in grades 4-8 from the years 2006 through 2011.

- Growth for students in grade 3 is calculated using Grade 2 Stanford 10 Reading and Mathematics scale scores.

- Growth for Grade 10 students is calculated using Grade 9 Stanford 10 Reading and Mathematics scale scores and their AIMS scores from as far back as 2006.

Composite Score

- Calculating the Percentage of Students Passing in Current Year

For elementary schools, the percentage of FAY students in grades 3-8 who met or exceeded the AIMS test in Reading and Mathematics in the current year were included. This was determined for each subject/grade combination across all subjects and grades for a school-wide total percent passing. (0-100 points possible).

For high schools, the percentage of FAY students in grade 10 who met or exceeded the AIMS test in Reading and Mathematics in the current year was determined. The high school calculation also includes the higher of the fall or spring test scores for students in grades 11 and 12 who took the exam twice in the same school year. This is determined for each subject/grade combination and averaged across all subjects and grades for a school-wide average percent passing.

$$\textbf{Percent Passing in Current Year} = \frac{\textbf{\# Students Passing AIMS in the current year}}{\textbf{\# Students Tested in the current year}}$$

Example:

Percent Passing - READING

Grade	Number of Students	Number Passing	Percent Passing
3	71	60	84.51%
4	91	83	91.21%
5	104	91	87.50%
All Students	**266**	**234**	**87.97%**

Percent Passing - MATHEMATICS

Grade	Number of Students	Number Passing	Percent Passing
3	71	59	83.10%
4	91	76	83.52%
5	104	82	78.85%
All Students	**266**	**217**	**81.58%**

	Percentage
Avg. Percent Passing (Reading)	87.97%
Avg. Percent Passing (Mathematics)	81.58%
Overall Avg. Percent Passing (Reading and Mathematics Combined)	84.78%
Total Points for Percent Passing	**85**

- Calculating Bonus Points for ELL Reclassification

Elementary and high schools can earn either 0 or 3 bonus points if a school reclassifies 30 percent or more of its ELL student population in a given school year. Full academic year status is not a consideration when determining ELL bonus points.

Criteria for ELL Bonus points (0 or 3 pts possible)
ELL students enrolled continuously in the ELL program within the school for at least 150 calendar days
Only schools with 16 or more students are evaluated
30% or more of students across all grades reclassified as proficient

For 2011 only, schools were held accountable to FY2010 ELL data but could earn 3 points using FY2011 data in one of two ways:

1. If a school's reclassification rate in 2010 was less than 30% but the school met the rate in 2011.

2. If a school's reclassification rate in 2011 was less than 30% but met the rate in 2010.

- If a school met the reclassification rate in both years, the school earned 3 points.
- Schools that did not meet the reclassification rate in either year did *not* earn ELL points as part of its final letter grade.

Beginning in 2012, schools and districts will be held accountable for current year ELL data for A-F letter grade calculations.

- Calculating Bonus Points for 5-year Graduation Rate

High schools and districts may earn 0 or 3 bonus points if they meet the graduation rate and dropout rate targets defined below. These criteria are the same as the criteria used to calculate the

AZ Learns Achievement Profiles. The Graduation Rate is a five-year, longitudinal measure of how many students graduate from high school.

The formula to calculate the one-year graduation rate used to determine whether a high school has met the target is:

$$\textbf{One-year Graduation Rate} = \frac{\textbf{\# in cohort who graduated within 5 yrs}}{\textbf{Original cohort + Transfers in - Transfers out}}$$

The three-year average is determined by taking the total number of combined five-year graduates for three most recent graduating cohorts and dividing by the total number of students in the combined cohorts:

$$\textbf{Three-year Graduation Rate} = \frac{\textbf{2008 + 2009 + 2010 five-yr grad rates}}{\textbf{Combined number of students in three cohorts}}$$

A school or district can earn 0 or 3 bonus points for its graduation rate based on the following:

Criteria for Grad Rate bonus points are earned in one of three ways		
Graduation Rates	**In order to meet the Target**	**Points Earned**
3-Year Avg. for 5-Yr Grad Rate	**>= 90%**	**3**
Current Year 5-Yr Grad Rate >= 74%	**1% Increase**	**3**
Current Yr 5-Yr Grad Rate < 74%	**2% Increase**	**3**

In 2011, the Baseline Year was 2006 or the school's first year serving grade 12, whichever was the latest. A school's annual average growth is calculated by subtracting the baseline year's rate from the current year's rate and dividing by the number of years spanned in the calculation.

$$\textbf{Average Annual Growth} = \frac{\textbf{Current one-year rate - Baseline one-year rate}}{\textbf{Number of years in span}}$$

- Calculating Bonus Points for Dropout Rate

The dropout rate is an annual measure of how many students drop out of a school during a twelve-month reporting period. The formula to calculate the one-year dropout rate used to determine whether the school/district has met the target is:

$$\textbf{One-year Dropout Rate} = \frac{\textbf{\# students who dropped out}}{\textbf{\# students enrolled during the school year}}$$

The three-year average is calculated by taking the total number of dropouts for the most recent three years and dividing by the total number of students enrolled:

$$\textbf{Three-year Dropout Rate} = \frac{\textbf{Total \# dropouts for 2009, 2010, and 2011}}{\textbf{Total \# of students enrolled in 2009, 2010, and 2011}}$$

A school or district can earn 0 or 3 bonus points for its dropout rate based on the following:

Criteria for Dropout Rate bonus points are earned in one of three ways		
Dropout Rates	**In order to meet the Target**	**Points Earned**
3-Yr Avg Dropout Rate	**<= 6%**	**3**
Current Yr Dropout Rate < = 9%	**1% Decrease**	**3**
Current Yr Dropout Rate > 9%	**2% Decrease**	**3**

In 2011, the Baseline Year was 2006 or the school's first year of operation, whichever was the latest. A school's annual average decrease is calculated by subtracting the baseline year's rate from the current year's rate and dividing by the number of years spanned by the calculation. A school will not be evaluated on dropout rate if it has less than 15 students in the group.

$$\textbf{Average Annual Decrease} = \frac{\textbf{Baseline one-year rate - Current one-year rate}}{\textbf{Number of years in span}}$$

- Calculating Total Composite Points

The Composite points comprise half of an entity's letter grade point total and are calculated by adding the point totals in each of the following areas to derive a composite point total.

	Points Possible
Percent Passing AIMS	**0 to 100**
ELL Target	**0 or 3 bonus points**
Graduation Rate Target	**0 or 3 bonus points**
Dropout Rate Target	**0 or 3 bonus points**
TOTAL Possible (ES/MS)	**100 + 3 bonus pts = 103**
TOTAL Possible (HS)	**100 + 9 bonus pts = 109**

Growth Score

- Understanding Growth and Student Growth Percentiles

The purpose of the growth component is to describe how well a school or district is growing its student population from one year to the next and describes academic gain relative to academic peers. More importantly, the growth model measures the degree to which a school or district is progressing its lowest achieving students academically across years. In June 2011, the State Board of Education defined gain as *student growth* and adopted the Arizona Growth Model to measure student gain as a component of the A-F letter grade accountability system.

The ADE uses Student Growth Percentiles (SGP) to measure one year's growth of student learning on the AIMS test in Reading and Mathematics. For accountability purposes in 2011, growth percentiles were calculated statewide for FAY students only.

Student Growth Percentiles

SGPs are whole numbers between 1 and 99 that indicate how one year of a student's growth compares to their statewide peer group. SGPs provide a relative ranking of student gain by comparing students who begin at the same starting point on the AIMS test in terms of their

mathematics and reading scale scores in the prior year and ranking their change in scale score in the current year on a scale between 1 and 99.

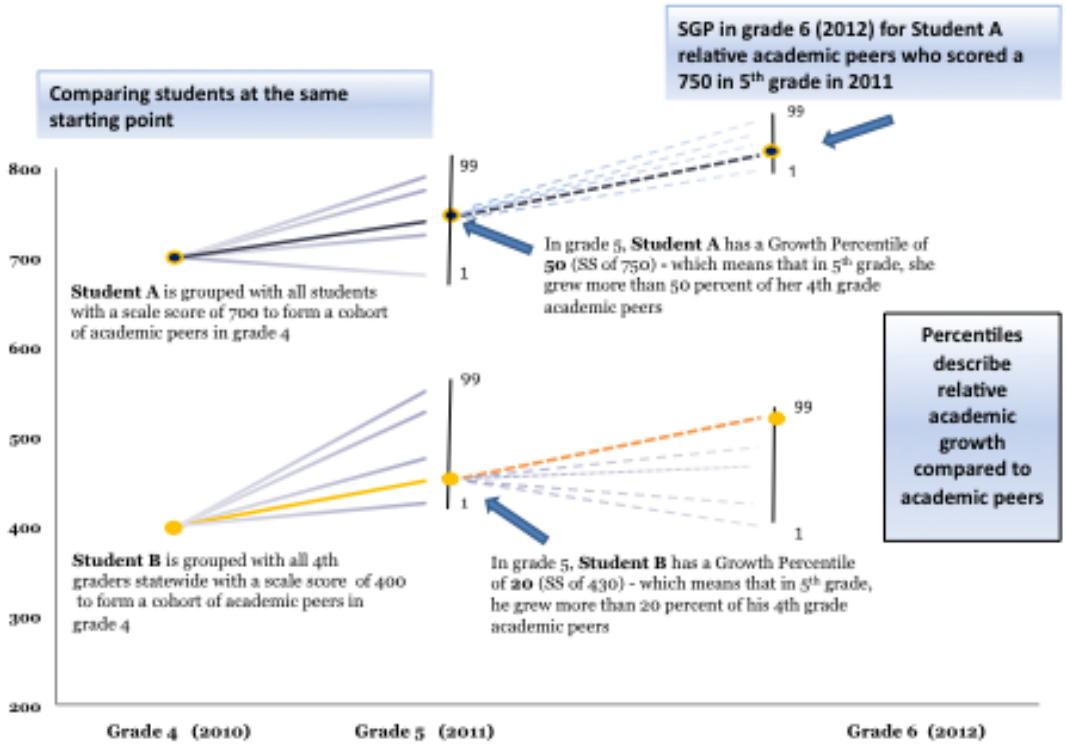
Quantile regression is used to calculate student growth percentiles. The methodology, introduced by Koenker and Bassett (1978), is ideally suited for estimating the family of conditional quantile functions (i.e., percentile curves). Growth percentiles are based upon the estimation of the conditional density associated with a student's score at time t using the student's prior scores at times 1, 2, . . . , $t-1$ as the conditioning variables. Given the conditional density for the student's score at time t, the growth percentile is defined as the percentile of the score within the time t conditional density (Betebenner, 2007).

For Arizona, this means that the estimation of the conditional density associated with a student's score in 2011 is based upon the student's prior scores back to 2006. The result is a percentile scale that reflects the likelihood of such an outcome given the student's prior achievement and a corresponding percentile rank for each student that demonstrates academic growth relative to a student's academic peer group.

Growth is calculated for all eligible students statewide using a free, downloadable statistical software package called 'R' (see http://www.r-project.org/ for more information on 'R'). Damian Betebenner of the *National Center for the Improvement of Educational Assessment* developed a SGP package for 'R' (quantreg) that calculates growth using statewide, matched student-level assessment results (McConnell, ACSA, 2011).

- Measuring Growth and Student Growth Percentiles

The following illustration depicts how student growth percentiles can be understood. Academic peer groups are matched longitudinally using at minimum, the two most recent years of test scores and up to five years of test scores are used to increase the precision of the growth groupings.



- Calculating Median Growth Percentiles & Growth Points

Student Growth Percentiles were used to derive median growth percentiles for all students and the bottom 25 percent of students for each school and LEA. The median represents a summary measure of the growth of many students and best describes the center of the distribution of student growth percentiles.

Schools and districts earned up to 100 points equal to the school or LEA's overall median growth percentile. For example, a median SGP of 65 means that the middle student (i.e., equal number of students scoring above and equal number of students scoring below) in the school grew more than 65% of other 'middle' students in schools statewide.

The steps to calculate a median growth percentile for all students within a given school is as follows:

1. Statewide, a percentile rank (1-99) was computed separately for Reading and Mathematics by grade for all FAY students statewide.

2. For each school, a median growth percentile was derived from the distribution of SGPs of all students by subject and grade.

3. These two medians (Reading & Mathematics) were averaged for an "All Students" rank between 1 and 99.

For example, an elementary school serving grades 3-8:

Median SGP		
Grade	**Mathematics**	**Reading**
3	**47**	**37**
4	**31**	**51**
5	**56**	**67**
6	**61**	**41**
7	**42**	**38**
8	**48**	**25**
	47.5	**43.2**
Median Growth	**45.3**	**43.2**
Median Growth – 'All Students'	**45**	

Growth Score

- Calculating the Bottom 25%

Calculating the bottom 25% in 2011 was based upon prior year achievement on the reading and mathematics sections of the AIMS test in 2010. Growth percentiles are not used to identify the bottom 25% but are used to determine the median growth percentile after this group has been determined.

Part I: (<u>Statewide</u>)

- For all FAY students statewide in grades 4-8 and 10, the first step is to calculate the difference between each student's prior year (2010) scale score and prior year *grade level* passing score (i.e. cut score for *Meets*) in Mathematics & Reading separately.
  - To determine the bottom 25% for high schools only, 8th grade AIMS scores are used as prior year scores

***Difference* = (Previous Year Scale Score – Previous Year Pass Score)**

Difference scores were calculated using the following cut scores for reading and mathematics:

Reading Difference

IF Current Year Grade is:			(Minus)	Reading
4	**=**	**Student PY Scale Score**	**-**	**431**
5	**=**	**Student PY Scale Score**	**-**	**450**
6	**=**	**Student PY Scale Score**	**-**	**468**
7	**=**	**Student PY Scale Score**	**-**	**478**
8	**=**	**Student PY Scale Score**	**-**	**489**
10	**=**	**Student PY Scale Score ***	**-**	**499**

***** AIMS cut scores in grade 8 (2009) used to determined *Difference* in grade 10

Mathematics Difference

IF Current Year Grade is:			(Minus)	Mathematics
4	**=**	**Student PY Scale Score**	**347**	**431**
5	**=**	**Student PY Scale Score**	**366**	**450**
6	**=**	**Student PY Scale Score**	**381**	**468**
7	**=**	**Student PY Scale Score**	**398**	**478**
8	**=**	**Student PY Scale Score**	**411**	**489**
10	**=**	**Student PY Scale Score ***	**537**	**499**

***** AIMS cut scores in grade 8 (2009) used to determined *Difference* in grade 10

Part 2: (Statewide)

For each student statewide in reading and mathematics, the *Difference score* was adjusted to account by weighting each student's scale score by their 2010 performance level (i.e., 1-4: where 1 = Falls Far Below, 2 = Approaches, 3 = Meets, 4 = Exceeds) and using a multiplier of 1,000 to adjust for negative values in order to spread the distribution. Transformations do not alter the essence of the data because each data point receives the same treatment and are reversible when the data need to be brought back to their original structure.

For example, a transformation that squares all values in a data set would eliminate negative values while maintaining relative relations among the data. The formula used in the A-F model removes negative numbers and accounts for the different passing scores in each grade. This step is calculated separately for high schools.

***Adjusted Difference* = (Difference + [AIMS performance level x 1,000])**

Part 3: (School-level)

- For each school, regardless of grade, students' *Adjusted Difference* scores were sorted by school entity id, subject and their *Adjusted Difference* score.
- Next, four Quartiles were derived to rank order the *Adjusted Difference* scores.
- The bottom 25% of students were determined for the entire school, regardless of grade, by identifying all students in the lowest quartile for Mathematics and Reading.
- For each school, the SGPs for students in the bottom 25% were used to determine the *Median Growth Percentile* for this grouping. These SGPs were the growth percentiles from the statewide calculations of growth.
- The average *Median Growth Percentile* for the Bottom 25% in a school/district was determined, which represents the average of the Reading and Mathematics median SGPs.

Example:

			STATE-LEVEL Calculation		**STATE-LEVEL Calculation**	**SCHOOL-LEVEL Calculation**
Grade	2010 Scale Score	2010 Cut Score	*Difference* score (2010 scale score - 2010 cut score)	2010 Performance Level (FAME 1-4)	*Adjusted Difference Score* (Difference + (AIMS performance level x 1,000))	Quartile (1=25%, 2=50%, 3=75%, 4=90%)
5	315	381	-66	1	934	Determined by rank order of Adjusted difference scores so that the lowest quartile of students are those with the lowest adj. difference scores within a given school

- Calculating the Bottom 25% - Grade 3 Only

- Statewide, the Grade 2 Stanford 10 Scale Scores in Reading and Mathematics were used in this calculation.
- At the school-level, prior year (grade 2) scale scores were sorted by school, entity id and subject.
- Reading and mathematics scale scores were separated into four quartiles.

- The bottom 25% was determined by identifying all students in the lowest quartile for Mathematics and Reading. These students represent the lowest scoring students on the Grade 2 Stanford 10 assessment in reading and/or mathematics.
- The SGPs for Grade 3 students in the bottom 25% were used to determine the median growth percentile in reading and mathematics.
- The *Median Growth Percentile* for the Bottom 25% was the average of the Reading and Mathematics median SGPs.

- Calculating Growth Points

A school or district earned between 1 and 100 points for the amount of growth it demonstrated for all students within that school/district and the bottom 25% of its lowest achieving students. The *Overall Growth Score* was determined by averaging the *Median Growth Percentiles* of 'All Students' and the Bottom 25% in Reading and Mathematics.

	Points Possible
Median growth percentile of all students in Reading and Mathematics combined ("All Student" Rank)	**1 to 100**
Median growth percentile of bottom quartile of students in Reading and Mathematics combined (Bottom 25%)	**1 to 100**
The average median of All Students and the Bottom 25% represents the Overall Growth Score (1-100 points)	

Total Score

- Calculating a Final Letter Grade

The total score was calculated by adding a school's composite score and its overall growth score together for a possible point total between 0 and 200 points The total points earned by a school are added up and compared to the school classification scale to determine a school's profile.

The following table reflects that range of possible points used to determine a final letter grade. A letter grade of 'F' could be earned if a school/district receives a letter grade of 'D' in three consecutive years.

Letter Grade	Total Points

A	**140 – 200**
B	**120 - 139**
C	**100 - 119**
D	**0 - 99**

AZ LEARNS Achievement Profiles for Alternative Schools

Alternative schools are defined as schools that meet the Board-approved definition as schools whose sole and clearly-stated mission is to serve specific populations of at-risk students. Alternative school status is granted by application to the ADE. *A.R.S. §15-241* makes an allowance for a "parallel" evaluation method for alternative schools. The alternative schools list for 2011 can be found here: http://www.azed.gov/research-evaluation/az-learns/.

- Definition of an Alternative School

The following is the definition of an alternative school as approved by the Board of Education in 2002.

1. A school operated by a school district must have adopted a mission statement that clearly identifies its purpose and intent to serve a specific student population (please see criterion three) that will benefit from an alternative school setting. A charter school must be expressly chartered to serve a specific student population that will benefit from an alternative school setting.
2. The educational program and related student services of the school must match the mission or charter of the school.
3. The school must intend to serve students exclusively in one or more of the following categories:
    - Students with behavioral issues (documented history of disruptive behavior)
    - Students identified as dropouts
    - Students in poor academic standing who are either severely behind on academic credits (more than one year) or have demonstrated a pattern of failing grades
    - Pregnant and/or parenting students
    - Adjudicated youth
4. Any school offering secondary instruction for academic credit used to fulfill Arizona State Board of Education graduation requirements (in part or in full) must offer a diploma of high school graduation.

Applying for Alternative School Status

To apply for alternative school status, an entity must submit a letter of application and supporting documentation to Achieve@azed.gov. The supporting documentation can include mission statements and any other information indicating that it is the school's sole mission to serve students listed in the definition above. The report card for a school applying for alternative status under AZ LEARNS must state in the "School Mission and Goals" section that it is an alternative

school. Failure to specifically state this in the school report card will result in the application being denied.

If a school does not have current year AIMS data, alternative status will not be granted.

Schools already granted alternative status need not reapply. If granted, alternative status will apply until the school asks to have alternative status revoked or the school closes. Alternative status is not granted or applied retroactively. Applications that are submitted after the deadline will not be processed until the next accountability cycle in the spring of the following year.

As there is no LEA designation of alternative status, an LEA will not be designated as alternative. The designation only applies at the school level for individual schools.

A-F Appeals Process

Currently, schools and districts are not being held accountable to the A-F Letter Grade Accountability system for school improvement purposes until the 2012-13 academic year. As a result, the ADE will not establish a substantive appeals process for A-F letter grades until that time and will not accept or consider any appeal of a preliminary or final A-F letter grade from a school or LEA in any form (electronic or otherwise) for the 2011-2012 academic year.

Because statistical appeals are no longer available, schools and LEAs that wish to address any data issues and correct their data may do so during the data correction window in order to confirm data accuracy. This Data Correction window has replaced the statistical appeal process. Note that LEAs are solely responsible for verifying information for their schools. Schools and LEAs will be notified in advance when the data correction window is available when ADE distributes its Accountability Timeline memo in the spring of 2012.

If an LEA does not change the information for its schools through the correction process, the ADE rightly assumes that the schools on file and all data available are correct as listed.